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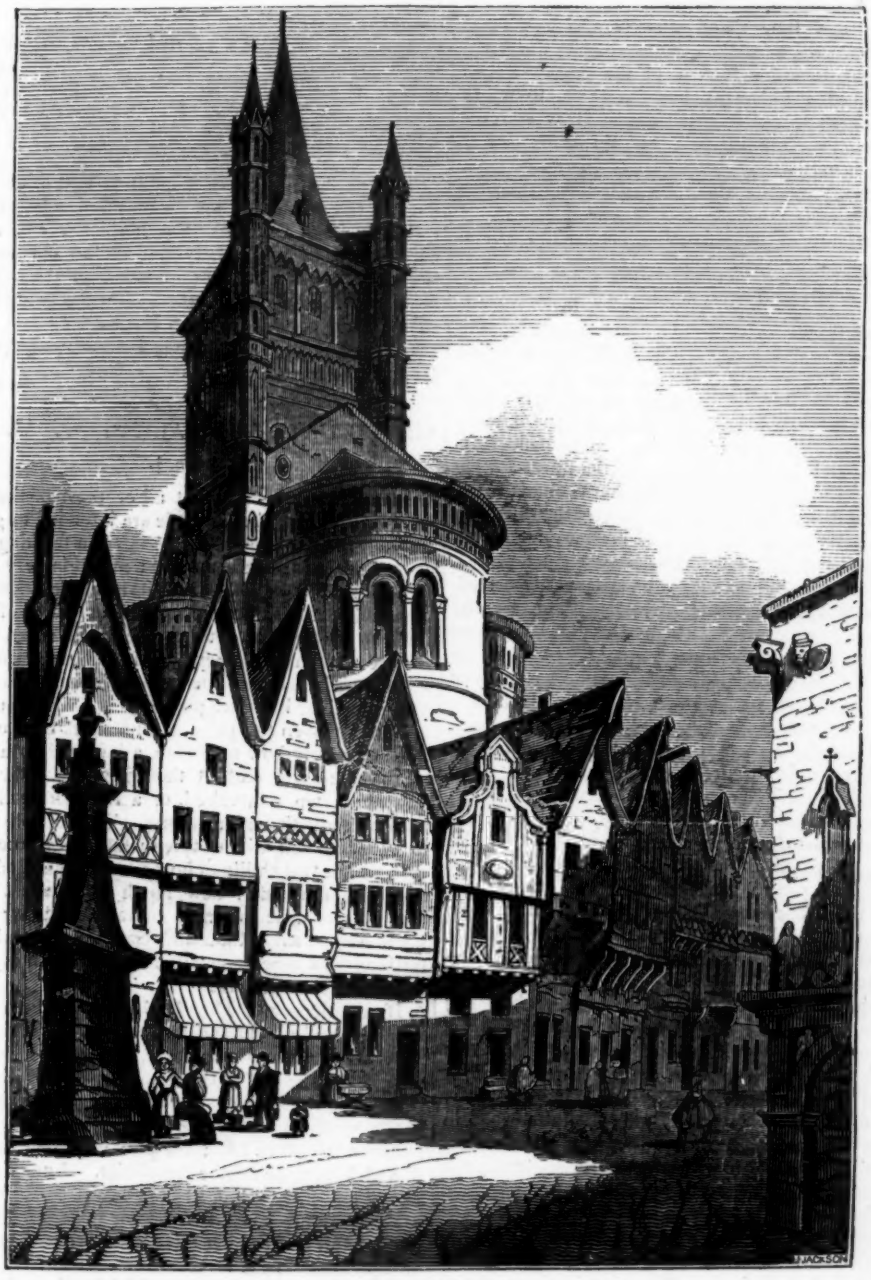
## COLOGNE.



[Church of St. Martin, Cologne.]

COLOGNE, called by the Germans Cöln, is situated in a district of the same name, which is one of the two divisions of the Prussian province of Jülich-Cleve-Berg, so called from its containing the three old duchies of Jülich or Juliers, Cleve, and Berg. Cologne is the capital of the whole province, and stands on the left or west bank of the Rhine, N. L. 50° 55′, E. L. 6° 45′, forming a kind of semicircle. The city is fortified, and with its numerous spires and large buildings makes a good show from the opposite side of the river. It is about one hundred and seven miles east by north from Brussels. Cologne was an old Roman station often mentioned in Tacitus, and took its name of Colonia Claudia Agrippinensis, or "the Colony of Claudius and Agrippina," from Agrippina the

daughter of Germanicus Cæsar, who was some time in these parts at the head of the Roman army. Agrippina, at the time when her name was given to the colony, was the fourth wife of her uncle, the feeble and worthless Emperor Claudius *; and was born at this place while her illustrious father commanded in Germany. The Roman word "colonia," *colony*, has been corrupted by the French into Cologne, and by the Germans into Cöln.

Under the Germanic Empire, Cologne was a free Imperial city, and had both a seat and voice as well in the Diets or Assemblies of Westphalia as in those of the Empire. At this time the Elector of Cologne occasionally resided here, as well as the Chapter of the Archbishop of Cologne and a Nuncio of the Pope. Urban VII. established a university here in 1388, to which succeeding Popes granted privileges. It is still the seat of a Catholic Archbishopric, but the university as such no longer exists.

Cologne cannot on the whole be called a handsome city, its streets being crooked, narrow, and dirty; but it has a great number of public buildings, and among them thirty-three churches and chapels. The population in 1830 was 65,145. The cathedral is a noble building, 400 feet long and 180 wide, which, owing to its magnitude, is a conspicuous object from a distance, overtopping every other edifice in the city. The body of the cathedral is supported by 100 pillars. Two high towers were designed for this building, one of which is raised to only about half the height intended, and the other is hardly begun. Were the cathedral completed, it is generally allowed it would be one of the finest Gothic buildings in Europe. Behind the high altar is the chapel of the three holy kings, or three wise men, as they are sometimes called, made of marble; the shrine which contains the bodies is remarkable for the curious and elaborate ornaments with which it is decorated. The names of the three wise men, according to some accounts, are Gaspar, Melchior, and Balthasar, whose bones, as the story goes, were first taken to Constantinople by the Emperor Constantine's mother; thence they were transferred to Milan; and finally obtained a sumptuous mausoleum in Cologne. What the precise merits of Gaspar, Melchior, and Balthasar were, we have not been able to make out satisfactorily. The parish church of St. Peter contains the Crucifixion of the Apostle, one of Rubens' finest pictures, which he gave as a present to the church in which he received the rite of baptism. This distinguished painter was a native of Cologne. The picture travelled to Paris during the time when the French were so busy in appropriating to themselves all the valuable works of this kind which they could lay their hands on: after the downfall of Bonaparte it returned home.

In the church of St. Ursula we see the tomb of this holy Virgin, and, as the legend would have us believe, the bones of her 11,000 virgin companions and martyrs: the church does in fact contain an immense number of bones, and in a certain chamber, some accounts say, there are, or were, several thousand skulls, arranged in good order and adorned with garlands and coronets. The fact of the bones being there seems undoubted; the proof of their belonging to the holy virgins does not seem quite so clear.

Besides these there are many other handsome churches in Cologne, one of which, the church of St. Martin, is represented in the wood-cut. This view is given, not so much for the beauty of the church, as to exhibit the general style of architecture in this old city.

The town-house has a fine portal formed by a double row of marble pillars. The old Jesuits' college, an extensive building, now contains a gymnasium or high school, with a library, a seminary for priests, and a valuable collection of old German paintings.

The situation of Cologne makes it a place of considerable trade, particularly with the German town of Frankfort-on-the-Main and Holland. In 1822, 4415 vessels of various sizes arrived at the town, and 2832 left it. The manufactures of Cologne are considerable; twenty-five tobacco manufactories, cotton, silk, and woollen wares, earthenware, soap, candles, &c.; and Cologne water, or *Eau de Cologne*, as it is commonly called, which is said to be made at twenty-four different establishments. The virtues of this water must be well known to all our readers; but if they have still any doubts on the subject, it is only necessary to read the printed French advertisement, which generally accompanies the bottle, and it is impossible to dispute the virtues of the commodity which the manufacturers extol so highly. A great deal of brandy is made at Cologne. The book manufactory of the town employs eighteen establishments and forty-two presses.

The public library of 60,000 volumes, the botanic garden, the school for the deaf and dumb, the various collections and cabinets, the hospitals, &c. are such appendages as we usually find in an old continental town. There is a bridge of boats over the river, which at Cologne is about 1250 paces wide, connecting the city with the opposite town of Deutz.

*** The statistical facts in this notice are from 'Cannabich's Geography,' a late German work.

* This imperial simpleton had made two engagements of marriage before he actually entered into the matrimonial state. In fact he had six wives, like our Henry VIII.

## SIMPLIFICATIONS OF ARITHMETICAL RULES.

### No. 1.

Our readers are aware that all or most of the common rules of commercial arithmetic are intended to give exact results, true to the nearest fraction of a farthing, a grain, or an inch, as the case may be; and it is very necessary that it should be so. But it is no less desirable to have other rules, more simple than those of the first class, to enable us to get near the result, when we do not require extreme accuracy. Without enlarging further upon the advantage of such rules, we will proceed to give one, intending in future papers to enter upon others.

Having given the price of one article, we often want to know nearly how much ten, a hundred, or a thousand of the same will cost, at the same rate. Or, knowing how much ten, a hundred, or a thousand will cost, we wish to know the price of one. The rule we are going to give will tell within three-pence how much ten will cost, within two shillings how much a hundred will cost, and within a pound how much a thousand will cost. The reverse rule is much more correct, for when we know how much a thousand cost, we may tell within a farthing how much one will cost. We will explain it by an example, as follows:—

If a gallon costs £3. 17*s.* 7¾*d.*, how much will ten, a hundred, and a thousand gallons cost respectively?

1. Write down the pounds, and by the side of them write down the half of the shillings, after which write a 5, if dividing the shillings by 2 gave a remainder, that is, if the shillings were odd in number. In the present instance this gives 385; the pounds 3, half the shillings 8, and 5 because of the remainder. Annex a cipher to this, which gives 3850.

2. Turn the pence and farthings into farthings only, adding 1 if the number of farthings thus obtained be 24 or upwards. In the present instance this gives 32; the number of farthings in 7¾*d.* is 31, and 1 is added because 31 is greater than 24.

3. Add the two last results together, which gives in this instance 3882, the sum of 3850 and 32.

To find the price of ten gallons nearly, annex a cipher to this, and cut off the three last places; this gives

38/820

The 38 is the number of pounds in the price of ten

gallons: to find the shillings and pence, as near as this rule can do it, we must deal with the 820 in such a manner as to reverse the process in (1) and (2); that is, we must ask what number of shillings and pence would have given us 820, if we had done with them what is directed to be done in (1) and (2). The reverse rule is;—

1. Double the first figure, and add 1 if the second figure be 5 or upwards; this is the number of shillings. It is 16 in this instance, since the second figure is not so great as 5.

2. Take away five from the second figure, if that can be done, and with the remainder and the third figure, or with the second and third figures form a number; which number diminish by 1 if it be 25 or upwards. In the present instance this gives simply 20, for the second figure is not so great as 5, nor is 20 so great as 25. If the number had been 887 instead of 820, we should have had 36; the 3 left from the 8 after 5 has been taken away giving 37, which is diminished by 1, because 37 is greater than 25.

3. Turn the last number, considered as farthings, into pence and farthings; which gives, in this case, 5 pence.

Hence the price of ten gallons by our rule is £38. 16*s*. 5*d*. The real price is £38. 16*s*. 5½*d*.

To find the price of a hundred gallons annex two ciphers to 3882 and cut off three places. This gives 388/200, which, treated in the same way, gives £388. 4*s*. 0*d*. The real price is £388. 4*s*. 7*d*.

To find the price of a thousand gallons annex three ciphers to 3882 and cut off three places, or, which is the same thing, annex no ciphers. This gives £3882. 0*s*. 0*d*.; the real price is £3882. 5*s*. 10*d*.

This rule, though it takes some time in the description, may be done after a little practice by the head alone; but with great facility by writing down only as much as is in the following example:—

| | | | |
|---|---|---|---|
| If 1 gallon costs | £42. | 6*s*. | 3½*d*. |
| | 42314 | | |
| 10 gallons cost | £423. | 2*s*. | 9¾*d*. |
| 100 „ | £4231. | 8*s*. | 0*d*. |
| 1000 „ | £42314. | 0*s*. | 0*d*. |

which are respectively too small by 1¼*d*., 14*d*., and 11*s*. 8*d*.

We write down the following examples, which the reader may verify by the rule:—

| | | | |
|---|---|---|---|
| If 1 costs | £2. | 0*s*. | 11½*d*. |
| 10 cost | £20. | 9*s*. | 5*d*. |
| 100 „ | £204. | 14*s*. | 0*d*. |
| 1000 „ | £2047. | 0*s*. | 0*d*. |

In this case, and in that where there is only one shilling, a cipher must be placed after the pounds. Thus the number from which these are deduced is 2047.

| | | | |
|---|---|---|---|
| If 1 costs | £31. | 9*s*. | 1¾*d*. |
| 10 cost | £314. | 11*s*. | 5*d*. |
| 100 „ | £3145. | 14*s*. | 0*d*. |
| 1000 „ | £31457. | 0*s*. | 0*d*. |

| | | | |
|---|---|---|---|
| If 1 costs | £0. | 19*s*. | 7¼*d*. |
| 10 cost | £9. | 16*s*. | 0*d*. |
| 100 „ | £98. | 0*s*. | 0*d*. |
| 1000 „ | £980. | 0*s*. | 0*d*. |

The rule always gives too little, except in the case where the number of pence is exactly 6*d*., in which case the answer is accurately true. For example,

| | | | |
|---|---|---|---|
| If 1 costs | £2. | 18*s*. | 6*d*. |
| 10 cost | £29. | 5*s*. | 0*d*. |
| 100 „ | £292. | 10*s*. | 0*d*. |
| 1000 „ | £2925. | 0*s*. | 0*d*. |

As it is very uncommon, when the price is above five shillings, to sell goods, except for an exact number of shillings and sixpences, this case will be found very convenient.

We may now describe the reverse rule. Knowing how many 10, 100, 1000, &c. cost, convert the sum into one number, by the first rule, strike off three places, and *as many more* as there are ciphers in the number named. For example, if 100 cost £4936. 18*s*. 7¾*d*., how much does one cost? The number is 4936932, from which I strike off *five* places; viz., the *three* which are struck off in every case, and *two* for the 2 ciphers in 100. This gives

49/36932

Retain only three figures on the right, or

49/369

which gives, treated according to the second rule, £49. 7*s*. 4¾*d*. for the price of one. This is within a farthing of the truth.

We have put the rule in such a way that those who do not understand decimal fractions may avail themselves of it. Those who understand decimals may be told that this process is a short one for converting any number of shillings and pence into the corresponding decimal of a pound. Thus £1. 15*s*. 6¾*d*. is £1·778 nearly.

Our coinage might be altered so as to make this rule exact, without altering the quantity of copper which is now coined into a pound sterling. It would require that the copper which now goes to 960 farthings or 240 pence, should be divided into a thousand farthings or 250 pence, the penny being four farthings, as at present. Of these farthings 50 would go to a shilling, instead of 48 as at present; so that the shilling would be twelve-pence half-penny. This would be inconvenient, but not very much so; and the silver and gold coinage would remain entirely untouched. The difference between the old and new farthing would be only one twenty-fifth part of the old farthing; so that if goods were sold at the same *nominal* price, the loss to the seller would be about a farthing in sixpence; or if the same real price were to be kept, the old price might be turned into the new, with exceeding accuracy, by adding a farthing for every sixpence. This would be very useful in the period of confusion which would elapse between the establishment of the new coinage and the death of the generation which was brought up under the old. It would become usual to sell goods by tens instead of dozens, which would very much facilitate arithmetical operations.

We are not advocates of any such change, but rather the contrary; but we are convinced that if any alteration ever take place, this should be the one.

We will only add that even at present a simple table, small enough to be engraved on wood or bone, which could be carried in the waistcoat pocket, is all that is necessary to work by this rule with perfect exactness to any extent.

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## THE FOSSIL IGUANODON.

The guana, or iguana, of the West Indies, of which a description and wood-cut were given in a recent number of this Magazine, appears to be the living type or representative of one of the largest and most extraordinary reptiles of a former world that has hitherto been found in a fossil state. The discovery of this animal, and of its structure and character, we owe to the scientific researches of Gideon Mantell, Esq., F.R.S., of Lewes in Sussex; and a detailed account of its osteology, with plates, was given by that gentleman in the Philosophical Transactions, 1825; and subsequently in an interesting work published in 1827, entitled 'Illustrations of the Geology of Tilgate Forest.' From the close resemblance of the bones and teeth to those of the guana, Mr. Mantell has named the fossil animal the iguanodon; but though there is a resemblance in structure between the living and the fossil animal, they differ enormously

in bulk. The living guana seldom exceeds the length of five feet: that of the iguanodon, estimated by the magnitude of the bones, must have been about seventy feet; the circumference of the body fourteen feet and a half; the length of the thigh and leg eight feet two inches; the foot, from the heel to the point of the claw, six feet; the height, from the ground to the top of the head, nine feet. Let the reader refer to the figure of the guana, No. 41, p. 332, and if he can, let him imagine it to be amplified to the dimensions here given, and he will form a better idea of the iguanodon than a verbal description could convey. The bones of the iguanodon are found imbedded in sandstone, in the quarries near Cuckfield in Sussex; they have also been found in similar strata in other parts of the county. In the same quarries are also found the bones of other large saurian or lizard-shaped animals, together with remains of turtles and fresh-water shells. No entire skeleton of the iguanodon has hitherto been discovered; but Mr. Mantell, from his knowledge of comparative anatomy, has been enabled to trace the connection of the different parts in a satisfactory manner. This was a labour of some years; nor was it until several of the teeth were found that he could determine the true character of the animal, which was an herbivorous masticating reptile. On comparing the teeth with those of various species of crocodiles and lizards, he discovered an identity of form with those of the living guana, as may be seen in the annexed drawings, which are correct representations of both. The reader may be surprised to find the teeth of the iguanodon, which are here given of the natural size, to be so apparently disproportionate to the bulk of the animal, but this is the case with the living guana; its length is five feet, but its teeth are not larger than those of mice.

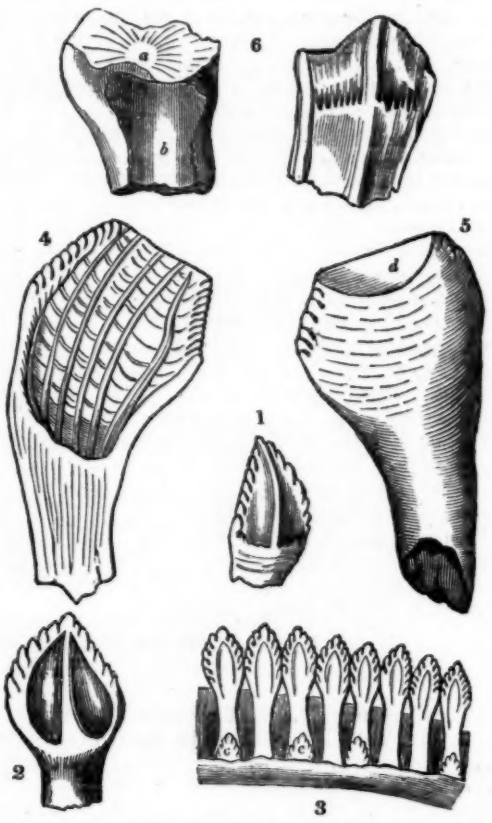
The living guana bites off the buds of vegetables, and swallows them without mastication; but from the worn-down state of some of the teeth, Mr. Mantell is decidedly of opinion that the iguanodon masticated its food: such was also the opinion of Baron Cuvier, who pronounced this animal to be "the most extraordinary creature that had ever been discovered." From the nature of its food it must have been a terrestrial reptile like the guana. The iguanodon, like one species of guana in St. Domingo, (Iguana cornuta,) had a bony protuberance or horn placed near the eyes: a fossil horn has been discovered; it is about the size of the lesser horn of the rhinoceros. The principal bones of the iguanodon collected in Mr. Mantell's Museum at Lewes, are immense vertebræ, ribs, thigh-bones of prodigious size, one measuring twenty-three inches in circumference, bones of the feet and toes, and enormous sharp-pointed claws. Mr. Mantell, describing the thigh-bone of such vast circumference, justly observes, "Were it clothed with muscles and integuments of suitable proportions, where is the living animal with a thigh that could rival this extremity of a lizard of the primitive ages of the world?"

It was for some time believed that the remains of the iguanodon were not to be found beyond the wealds of Sussex and Kent; but recently, teeth nearly resembling those of this animal have been discovered by Dr. Jager in Germany.

During the last summer Mr. Mantell discovered the remains of another species of fossil reptile, less than the iguanodon, but resembling it in part of its structure, though differing from it and from all other known reptiles in other parts. It appears to have had a range of enormous scales or spines upon its back, resembling in form those of the guana, as represented in the drawing of that animal before referred to. Mr. Mantell read a description of the parts of this reptile, and exhibited its remains, at a meeting of the Geological Society in December last. He is now of opinion, that from the dislocated and broken bones being still placed in a certain relation to each other, they must have been injured and subsequently disjointed while covered by muscles and integuments.

From the extreme hardness of the stone in which the bones are imbedded, great skill and care were required in removing the stone. The strata of Tilgate Forest, in which these organic remains are found, contain exclusively the shells of fresh-water animals and terrestrial plants. The chalk, which nearly surrounds the strata of the weald, contains the remains of marine animals only.

[Teeth of the Fossil Iguanodon and of the Guana.]




1. Crown of a tooth of the Iguanodon not worn by use, and in this state closely resembling *fig.* 2.
2. A magnified view of a tooth of the recent Guana.
3. Portion of the upper jaw of the recent Guana, with eight teeth highly magnified.
4. Front view of a tooth of the Iguanodon, *natural size*, the point worn off by grinding its food.
5. Back view of a similar tooth; the worn surface marked *d*.
6. Front and back view of a tooth of the Iguanodon worn down by use. *a* the worn surface. *b* the cavity formed by the pressure of a new tooth, as in the recent jaw, *fig.* 3, *c*.

## A PARTY OF EMIGRANTS TRAVELLING IN AFRICA—(*Concluded from No.* 51).

In the mode described in a former number we travelled for ten days; the features of the country changing from dark jungle to the open champaign, and from that again to the desolate sterility of savage mountain scenery, or of parched and desert plains, scattered over with huge ant hillocks and flocks of springboks. Here and there a solitary farm-house appeared near some permanent fountain, or willow-margined river; and then again the wilderness, though clothed perhaps with verdant pasturage and bedecked with magnificent shrubbery, extended from twenty or thirty miles, without a drop of water. It was consequently uninhabitable except after heavy rains.

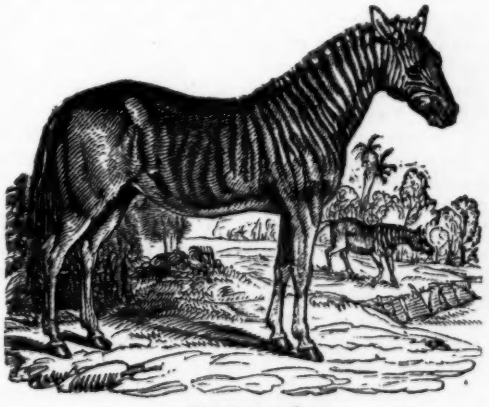
At length we reached Roodewal, a military post on the Great Fish River, 200 miles from Algoa Bay, and about 50 miles distant from the spot allotted for our location. Here we were most hospitably entertained for a couple

of days by the officers of the garrison and their ladies; after which we proceeded on our journey, accompanied by an additional escort of seven or eight armed boors on horseback. Having crossed the Great Fish River, the old boundary of the colony, we entered a region from which the Caffers and Ghonaquas had only been recently expelled; and which was considered as still peculiarly exposed to their predatory inroads. The new colonial frontier had been advanced to the River Keissi, seventy or eighty miles to the eastward; and the intervening territory, now entirely destitute of human inhabitants, was literally "a waste and howling wilderness," occupied only by herds of wild animals,—elephants, buffaloes, quaggas, and antelopes—and by the formidable beasts of prey,—lions, leopards, and hyænas, which are always found when their victims are abundant.

The upper or northern part of this territory consists of a chain of lofty and rugged mountains, partly clothed with forest, and intersected with deep and fertile glens, through which the Kat, the Koonap, the Mancazana, the Baviaan, and other streams issue forth to join the Great Fish River. At the source of the last of these streams, the *Baviaans Rivier*, or RIVER of BABOONS, lay the *location*, or allotment, of our little party; distant a hundred miles, at least, from the nearest part of the *English* settlement. Our journey up this glen, from the spot where it issued from the mountains, about twenty miles above Roodewal, occupied five days, and was by far the most arduous portion of our whole expedition. The distance did not exceed thirty English miles; but after we had advanced a short way through a most picturesque defile, which wound, as it were, into the very bowels of the mountains, the road (which thus far was kept in tolerable repair for the conveyance of timber from a magnificent forest on the right) suddenly failed us; and we were literally obliged to hew out our path up the Valley of Baboons, through jungles and gullies, and beds of torrents and rocky acclivities; forming altogether a series of obstructions which it required the utmost exertions of the whole party, and of our experienced African allies, to overcome.

The scenery through which we passed was in many places of the most singular and imposing description. Sometimes the valley widened out, leaving space for fertile savannas along the river side, prettily sprinkled over with shrubbery and clumps of mimosa trees, and clothed with luxuriant pasturage, up to the bellies of our oxen. Frequently, the mountains, again converging, left only a narrow defile, just broad enough for the stream to find a passage; while precipices of naked rock rose abruptly, like the walls of a rampart, to the height of many hundred feet, and in some places appeared absolutely to overhang the savage-looking pass (or *poort*, as the boors called it), through which we and our waggons struggled below; our only path being occasionally the rocky bed of the shallow river itself, encumbered with huge blocks of stone which had fallen from the cliffs, or worn smooth as a marble pavement by the sweep of the torrent floods. At this period the River of Baboons was a mere rill, gurgling gently along its rugged course, or gathered here and there into natural tanks, called in the language of the country *Zeekoe-gats* (hippopotamus pools); but the remains of water-wrack, heaved high on the cliffs, or hanging upon the tall willow trees, which in many places fringed the banks, afforded striking proof that at certain seasons this diminutive rill becomes a mighty and resistless flood. The steep hills on either side often assumed very peculiar and picturesque shapes, embattled, as it were, with natural ramparts of freestone rock; and garrisoned with troops of large baboons, which inhabit these mountains in great numbers. The lower declivities were covered with good pasturage, and sprinkled over with evergreens and acacias; while the cliffs that overhung the river had their wrinkled fronts embellished with various species of succulent plants and flowering aloes. In other spots the freestone or basaltic rocks, partially worn away with the waste of years, had assumed shapes the most singular and grotesque; so that, with a little aid from fancy, one might imagine them the ruins of Hindoo or Egyptian temples, with their half-decayed obelisks, columns, and statues of monster-deities.

It were tedious to relate the difficulties, perils, and adventures, which we encountered in our toilsome march of five days, up this African glen;—to tell of our pioneering labours with the hatchet, the pick-axe, the crow-bar, and the sledge-hammer,—and the lashing the poor oxen, to force them on (sometimes 20 or 30 in one team) through such a track as no English reader can form any adequate conception of. At length, after extraordinary exertions and hair-breadth escapes—the breaking down of two waggons, and the partial damage of others—we got through the last *poort* of the glen, and found ourselves on the summit of a stony ridge, commanding a view of the extremity of the valley. "And now, mynheer," said the Dutch-African field-cornet who commanded our escort, "*daar leg uwe veld*—their lies your country." Looking in the direction where he pointed, we beheld, extending to the northward, a beautiful vale, about six or seven miles in length, and varying from one to two in breadth. It appeared like a verdant basin or *cul de sac*, surrounded on all sides by an amphitheatre of steep and sterile mountains, rising in the back-ground in sharp and serrated ridges of very considerable elevation; their summits being at this season covered with snow, and estimated to be from 6000 to 7000 feet above the level of the sea. The lower declivities were sprinkled over, though somewhat scantily, with grass and bushes. But the bottom of the valley, through which the infant river meandered, presented a warm, pleasant, and secluded aspect; spreading itself into verdant meadows, sheltered and embellished, without being encumbered, with groves of mimosa trees, among which we observed in the distance herds of wild animals—antelopes and quaggas—pasturing in undisturbed quietude.



[The Quagga.]

"Sae that's the lot o' our inheritance, like?" quoth one of the party, a Scottish agriculturist. "Aweel, noo that we've really got till 't, I maun say the place looks no sae muckle amiss, and may suit our purpose no that ill, provided thae haughs turn out to be gude deep land for the pleugh, and we can but contrive to find a decent road out o' this queer hieland glen into the lowlands—like ony Christian country."

Descending into the middle of the valley, we unloaded the waggons and pitched our tents in a grove of mimosas, on the grassy margin of the river; and the next day our armed escort with the train of shattered vehicles set out on their return homeward, leaving us in our wild domain to our own courage and resources.

P.

## THE NEW RIVER.

IT was on the 1st of February, in the year 1608, that the cutting of the canal was begun for the admission of the New River, the bountiful source from which the greater part of London is now supplied with one of the first necessaries of existence. For a long period the inhabitants of this metropolis derived the water they required for domestic purposes through the labour of water carriers, who fetched it from the Thames, and from various other open streams, such as the Fleet and its tributaries, which were carried in their natural course towards the hollow in which the city stands. The intrepid drinkers do not seem to have given themselves much concern about the quality of the water, so long as the quantity was sufficient. The Londoners appear to have remained satisfied with their ditches, and with the different wells which were sunk in the gardens of the religious houses and in some other spots; till on the one hand the increase of the city rendered the supply from these sources inadequate, while on the other the covering in of several of the formerly exposed streams, as houses and streets extended in various directions, deprived them of some of their ancient resorts. It was in the year 1236 that water was first brought into the town in leaden pipes from the village of Tyburn (which stood not far from the present Stratford Place, in Oxford Road). Nine conduits, or fountains, which were then erected here, were retained by the city of London till the beginning of the last century. After this first attempt, water was brought in the same manner from Islington, Hackney, Hoxton, and various other places. It was not till towards the end of the sixteenth century that any water was raised by machinery from the Thames. The first work erected for that purpose was the construction of Peter Maurice, a German engineer. The supply obtained in these different ways was distributed to the public by means of conduits, or as Maitland expresses it, "cisterns of lead, castellated with stone," which were raised in the middle of the principal streets. The largest and most ancient of these was that which stood in Westcheap, and which had been erected in the year 1285; but they at last amounted to above twenty in all. Many of these were not taken down till towards the middle of the last century. On the 18th of September, Stow informs us, it was the custom for the Lord Mayor and Aldermen, mounted on horseback, to pay an annual visit to the head conduits at Tyburn; on which occasion they hunted a hare before, and a fox after dinner, in the neighbouring fields.

Notwithstanding, however, the supplies that had been obtained both from the Thames, and from the various other streams in the immediate neighbourhood, a considerable scarcity began to be felt towards the end of the reign of Elizabeth, which increased after her successor came to the throne. This may perhaps have been one of the reasons which produced the series of prohibitions issued about this time against the further extension of the city by new buildings. In these circumstances different projects were suggested; but although an act of parliament was passed granting liberty to the city to make the necessary cut for bringing water from any part of Middlesex or Hertfordshire, no one for some years could be found bold or patriotic enough to engage in the adventure. At last the speculation was undertaken by a public-spirited citizen, Mr. Hugh Myddleton, of whose origin and early history not much more, we believe, is known than that his father, Richard Myddleton, had from the reign of Edward VI. been Governor of Denbigh Castle. He himself had followed the business of a goldsmith; but had amassed his fortune principally by some Welsh mines which he had taken a lease of and worked. The city having transferred to him all the powers, rights, and privileges conferred by the act, he prepared to cut his canal from the height immediately north of London to the rivers Chadwell and Amwell, near Ware, in Hertfordshire,—a track of nearly forty miles in length. We cannot enter into a detail of the numerous obstacles of various kinds in the face of which this gigantic enterprise was prosecuted and finally accomplished. In addition to the difficulties arising from the nature of the ground, which presented great diversity of bottom as well as of level, others of a still more formidable and discouraging nature soon began to beset the progress of the undertaking. The envy of some, and the contempt and ridicule of others, aided the opposition by which interested and influential parties were enabled, under pretence of the public good, to seek their own ends. Then, worst of all, came the deficiency of Myddleton's means; the expense of the works turned out so much greater than he had anticipated, that long before it was brought to a close it had swallowed up the whole of his large fortune. He was obliged to crave the assistance both of the King and of the city. It is said that the whole sum which he expended did not fall short of five hundred thousand pounds. At this cost, however, the work was at last finished in the autumn of 1613. On Michaelmas that year, the day on which Sir Thomas Myddleton, Mr. Myddleton's brother, was elected Lord Mayor, the water was admitted into the basin at Pentonville, with much form and ceremony, in the presence of the Lord Mayor then in office, the Aldermen, the Recorder, and many of the principal citizens. A body of about sixty of the labourers, tastefully dressed, having marched three times round the basin, preceded by drums and trumpets, the whole then stopped, when one of their number addressed the civic dignitaries and the company, who were seated on an eminence, in a rude metrical effusion of considerable length, which Stow has preserved, but of which we can only afford to quote a very few lines:—

> "Clerk of the work, reach me the book, to show
> How many arts from such a labour flow.
> First, here's the Overseer, this tried man,
> An ancient soldier, and an artizan;
> The Clerk next him, a mathematician.
> The Master of the Timber-work takes place
> Next after these; the Measurer in like case,
> Bricklayer and Engineer; and after those
> The Borer and the Paviour; then it shows
> The Labourers next; Keeper of Amwell Head;
> The Walkers last; so all their names are read.
> Yet these but parcels of six hundred more,
> That at one time have been employed before."

On the conclusion of this address, the sluices were opened, and amidst the sound of drums and trumpets, the discharge of ordnance, and the acclamations of the multitude, the water rushed into the basin, which it has never since ceased to fill.

It is lamentable to reflect that Myddleton was entirely ruined by this speculation. This misfortune befell him, notwithstanding that the King resigned to him the share, being one half, of the profits to which he was entitled by their agreement, retaining only the right to an annual payment of £500. The value of the shares thus relinquished, which are called the King's shares, still remains somewhat lower in the market than that of the others, or the Adventurers' shares, in consequence of each holder being burdened with his proportion of this payment. Myddleton was knighted soon after the completion of his great work, and he was made a baronet in 1622. He was now, however, obliged to support himself by taking employment as an engineer. He died in 1631 in poor circumstances; and not long ago some of the descendants of this great national benefactor were found in a state of such destitution as to call for an appeal in their behalf to the charity of the public.

The undertaking, however, which thus brought ruin upon the man by whom it was projected and executed, has formed the source of great wealth to many other individuals. To the inhabitants of London and its vicinity in general, the New River has proved a blessing of incalculable magnitude. According to the

report of a commission appointed under the great seal, in 1828, the number of tenants supplied by the New River Company was then between 66,000 and 67,000, and the quantity of water daily supplied exceeded 13,000,000 gallons, being about 2,000,000 cubic feet. This was a quantity rather exceeding the whole of that supplied by the other four water companies, the East London, the West Middlesex, the Chelsea, and the Grand Junction, upon which the northern portion of the metropolis is dependent. Even including the large districts of Southwark and Lambeth, which are served by the Lambeth, the South London, and the Southwark works, the whole quantity consumed daily was about 29,000,000 gallons, or 4,650,000 cubic feet, not a great deal more than twice that supplied by the New River alone. The whole quantity of 29,000,000 gallons of water, daily supplied to the inhabitants of London, is distributed to about 125,000 houses and other buildings, which is at the rate of above 200 gallons every day to each house. The average cost to each house for this wonderful supply is about two-pence a day; which is a less price than the labour of an able-bodied man would be worth to fetch a single bucket from a spring half a mile from his own dwelling.

The following extract from Dr. Arnott's Elements of Physics well explains the general nature of the arrangements by which this immense distribution is effected, and places in a striking light the inestimable importance of the blessing which London thus enjoys:—

"The supply and distribution of water in a large city, particularly since the steam-engine has been added to the apparatus, approaches closely to the perfection of nature's own work in the circulation of blood through the animal body. From the great pumps, or a high reservoir, a few main pipes issue to the chief divisions of the town; these send suitable branches to the streets, which branches again divide for the lanes and alleys; and at last subdivide until into every house a small leaden conduit rises, which, if required, carries its precious freight into the separate apartments, and yields it there to the turning of a cock. A corresponding arrangement of drains and sewers, most carefully constructed in obedience to the law of level, receives the water again when it has answered its purposes, and carries it to be purified in the great laboratory of the ocean. And so admirably complete and perfect is this counter-system of sloping channels, that a heavy shower may fall, and, after washing and purifying every superficial spot of the city, and sweeping out all the subterranean passages, may, within the space of an hour, be all collected again in the river passing by. It is the recurrence of this almost miracle, of extensive, sudden, and perfect purification, which has made London the most healthy, while it is the largest city in the world. English citizens have now become so habituated to the blessing of a supply of pure water, more than sufficient for all their purposes, that it no more surprises them than the regularly returning light of day or warmth of summer. But a retrospect into past times may still awaken them to a sense of their obligation to advancing art. How much of the anxiety and labour of men in former times had relation to the supply of this precious element! How often, formerly, has periodical pestilence arisen from deficiency of water, and how often has fire devoured whole cities, which a timely supply of water might have saved! For these reasons kings have received almost divine honours for constructing aqueducts, to lead the pure streams from the mountains into the peopled towns. In the present day, only he who has travelled on the sandy plains of Asia or Africa, where a well is more prized than mines of gold, or who has spent months on ship-board, where the fresh water is doled out with more caution than the most precious product of the still, or who has vividly sympathized with the victims of siege or ship-wreck, spreading out their garments to catch the rain from heaven, and then, with mad eagerness, sucking the delicious moisture—only he can appreciate fully the blessing of that abundant supply which most of us now so thoughtlessly enjoy. The author will long remember the intense momentary regret with which, on once approaching a beautiful land, after months spent at sea, he saw a little stream of fresh water sliding over a rock into the salt waves—it appeared to him as a most precious essence, by some accident pouring out to waste."

## THE DESTRUCTION OF SENNACHERIB.

The Assyrian came down like the wolf on the fold,
And his cohorts were gleaming in purple and gold;
And the sheen of their spears was like stars on the sea!
When the blue wave rolls nightly on deep Galilee.

Like the leaves of the forest when summer is green,
That host with their banners at sunset were seen:
Like the leaves of the forest when autumn hath blown,
That host on the morrow lay wither'd and strown.

For the angel of death spread his wings on the blast,
And breathed in the face of the foe as he pass'd;
And the eyes of the sleepers wax'd deadly and chill,
And their hearts but once heav'd, and for ever grew still.

And there lay the steed with his nostril all wide,
But through it there roll'd not the breath of his pride:
And the foam of his gasping lay white on the turf,
And cold, as the spray of the rock-beating surf.

And there lay the rider distorted and pale,
With the dew on his brow and the rust on his mail;—
And the tents were all silent, the banners alone,
The lances uplifted, the trumpet unblown.

And the widows of Ashur are loud in their wail,
And the idols are broke in the temple of Baal;
And the might of the Gentile, unsmote by the sword,
Hath melted like snow in the glance of the Lord!

Byron.

## MOZART.

The 27th of January is the anniversary of the birth of a wonderful being, the great musician Mozart. John Chrysostom Wolfgang Theophilus Mozart was the son of Leopold Mozart, one of the musicians belonging to the chapel of the Prince Archbishop of Saltzburg, in which town he was born in 1756. He, and a sister four years older than himself, alone of a family of seven children survived the years of infancy. His father and mother were both remarkable for their good looks,—an advantage which their son did not inherit. But he was almost from the cradle a prodigy of musical genius. He was only three years old when his attention was excited in the most extraordinary manner by the lessons which his father then began to give his sister on the harpsichord; and in another year he was rapidly learning to play minuets and other pieces of music himself. At the age of five, he composed numerous pieces, which his father wrote down. Music now became the child's only passion; the society of his little playmates was abandoned; he would have willingly remained at his harpsichord almost from morning to night. Soon after this, his father determined to exhibit him at the different German courts. In the autumn of 1762, accordingly, the whole family proceeded to Vienna. Here the boy played before the Emperor Francis I., when his performance excited the utmost astonishment among some of the first proficients in the art. It was with reluctance, indeed, that he would consent to play except to those whom he believed to be judges of music. When he first sat down to his instrument with the Emperor by his side, "Is not M. Wagenseil here?" he said, addressing himself to his Majesty; "we must send for him; he understands the thing." That composer was accordingly brought forward to occupy the place of the Emperor; and he turned over the leaves of one of his own concertos, while the piece was executed by his young brother artist. Soon after this Mozart learned, nearly without instruction, to play on the violin. Next year he visited in succession Munich, Augsburg, Mannheim, Francfort, Coblentz, Brussels, and lastly Paris; in all of which cities his performances were listened to with universal delight and wonder. Nor did he produce less effect when, in April 1764, he made his appearance in England. After playing the organ in the Royal Chapel, he and his sister gave a grand concert, all the symphonies of which were of his own composition. "Notwithstanding their continual removals," says his Life by M. Schlictegroll, "they practised with the greatest regularity, and Wolfgang began to sing diffi-

cult airs, which he executed with great expression. The incredulous, at Paris and at London, had put him to the trial with various difficult pieces of Bach, Handel, and other masters; he played them immediately, at first sight, and with the greatest possible correctness. He played one day, before the King of England, a piece full of melody, from the bass only. At another time, Christian Bach, the Queen's music-master, took little Mozart between his knees, and played a few bars. Mozart then continued, and they thus played alternately a whole sonata, with such precision, that those who did not see them thought it was executed by the same person. During his residence in England, that is, when he was eight years old, Wolfgang composed six sonatas, which were engraved at London, and dedicated to the Queen."

He remained in this country till July, 1765, and then returning to the Continent, made a tour through the principal towns of the Low Countries. After this he revisited Paris, and thence proceeded by the way of Lyons and Switzerland to his native place, which he reached in November, 1766. He remained at home, assiduously engaged in the practice of his art, for above three years. At length, in December 1769, he set out for Italy. Though he had now reached his fourteenth year, the additional skill he had acquired more than compensated for any diminution of the wonder that had at first been excited by his extreme youth. He was now a perfectly accomplished musician; and his performances, being in themselves nearly all that the most refined taste and science could desire, required no tale of the marvellous to set them off. After visiting Milan, Bologna, and Florence, he reached Rome in the Passion week. Here he performed the surprising feat of memory of taking down, after hearing it in the Sistine chapel, the famous Miserere of Gregorio Allegri, of which the performers of the chapel are said to have been forbidden to give a copy, on pain of excommunication. A second opportunity of hearing it played a few days after, enabled Mozart, who held his first sketch in the crown of his hat, to make his copy more perfectly correct; and next year the music was published in London, under the superintendence of Dr. Burney. His progress through this land of music was a continued triumph. While he was playing at Naples, the audience suddenly took it into their heads that a ring which he wore on his finger was a talisman, and interrupted the performance until he consented to lay it aside, and to convince them that he was not indebted to the art of magic for his wonderful power. Returning to Milan, he there produced his first opera, the 'Mithridate.' It was played for twenty nights in succession. For some succeeding years his time was principally spent at Saltzburg, with occasional visits to Milan, Munich, and Vienna. At last, in September 1777, he proceeded in company with his mother to Paris, with the intention of making that capital their residence. But soon after their arrival, his mother, to whom he was tenderly attached, died; and that event, added to the strong contempt with which he regarded the then prevailing musical style of the French, determined him to return to his father. He left Saltzburg again in November, 1779, for Vienna; and in this capital he remained till the close of his life. Here, at the age of twenty-five, he married Mademoiselle Constance Weber, who proved to him one of the best of wives; and it was in the first glow of his passion for this lady, that he composed his celebrated opera of 'Idomeneo,' which he always regarded as the greatest of his works. After this he wrote his 'Zauberflöte,' his 'Nozze di Figaro,' his 'Don Giovanni,' and his 'Clemenza di Tito,' which all rank among the noblest triumphs of musical genius.

Mozart's last work was his celebrated 'Requiem,' which was undertaken at the order of a stranger. The circumstances under which he received this commission being somewhat mysterious, as related by the German biographer already quoted, are said to have had an unfavourable influence on his spirits and health. The fact is certain, that while in a very weak and sickly state, he applied himself with great ardour to the composition of this Requiem. While thus employed, he was seized with the most alarming fainting fits; but the work was persisted in and completed before his death, which took place on the 5th December, 1792, when he had not completed his thirty-seventh year.

[Portrait of Mozart.]

*Infant Asylums.*—It is deserving of attention, that, independently of schools for the elementary instruction of children above the age of six, in the Duchy of Saxe Weimar, every village contains a district asylum for the reception of children below that age, who have hitherto been left without any superintendence at home, whilst their parents were absent at their work. This abandonment has been, and notoriously is, the prolific source of idle and vagabond habits, which it is extremely difficult to eradicate in after years. The asylums in question have, therefore, been opened for the purpose of remedying this crying evil; the parents send their children to them in the morning, and fetch them home in the evening. In the interim they are fed and taken care of, besides being taught to read and say their prayers. There is not a single village in the whole Grand-duchy, which is not provided with one of these excellent '*Asylum Schools*,' as they are termed; and they are rapidly spreading all over Germany.—*Quarterly Journal of Education, No. IX.*

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